Statistics 401B Syllabus  
Fall 2015

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2-3 MWF (and by appointment or good fortune)  
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Course Web Page: [http://www.public.iastate.edu/~vardeman/stat401/stat401B.html](http://www.public.iastate.edu/~vardeman/stat401/stat401B.html)

Texts:  
* Basic Engineering Data Collection and Analysis* by Vardeman and Jobe  
* An Introduction to Statistical Learning* by James, Witten, Hastie, and Tibshirani  
(This second book can be legally downloaded at [http://www-bcf.usc.edu/~gareth/ISL/](http://www-bcf.usc.edu/~gareth/ISL/))

Course Requirements:  
1. Class attendance and note-taking (there will be material covered in class not found in the texts),  
2. Three in-class hour exams (September 24, October 22, November 19),  
3. One two-hour comprehensive final exam during finals week (9:45 AM Friday December 18)  
   (NOTE THIS IS FRIDAY OF FINALS WEEK … DO NOT PLAN TO LEAVE TOWN EARLY EXPECTING TO PETITION TO TAKE THE EXAM EARLY… SUCH WILL NOT BE ALLOWED), and  
4. Regular laboratories and homework sets. The former will be due at the beginning of the following week's Thursday laboratory. Homework sets will typically be due at the beginning of class on select Fridays.

Course Outcomes: By the end of the course you will  
1. understand and apply calculus-based probability theory and stochastic simulations.  
2. understand and apply basic one and two-sample methods of statistical inference.  
3. understand and apply one-way/r-sample Gaussian models and methods of statistical inference.  
4. understand and apply classical (ordinary least squares) methods of multiple linear regression analysis and associated inference.  
5. understand and apply simple likelihood-based methods of non-linear regression and logistic regression and associated statistical inference.  
6. understand and apply classical methods of statistical inference for two-level factorial studies.  
7. understand and apply basic methods (prediction and classification) of modern supervised statistical learning.  
8. have basic facility with the R statistical package and RStudio.
Approximate Class Reading Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Reading Material</th>
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<tbody>
<tr>
<td>1 (8/24-8/28)</td>
<td>Ch1, Ch2, Ch3, A.1 V&amp;J</td>
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<tr>
<td>2 (8/31-9/4)</td>
<td>Ch5 V&amp;J</td>
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<tr>
<td>3 (9/7-9/11)</td>
<td>Ch5, Ch6 V&amp;J</td>
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<tr>
<td>4 (9/14-9/18)</td>
<td>Ch6 V&amp;J</td>
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<tr>
<td>5 (9/21-9/25)</td>
<td>Ch6, Ch7 V&amp;J</td>
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<tr>
<td>6 (9/28-10/2)</td>
<td>4.1, 4.2, Ch9 V&amp;J</td>
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<tr>
<td>7 (10/5-10/9)</td>
<td>4.1, 4.2, Ch9 V&amp;J</td>
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<tr>
<td>8 (10/12-10/16)</td>
<td>4.1, 4.2, Ch9 V&amp;J</td>
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<tr>
<td>9 (10/19-10/23)</td>
<td>A.5 V&amp;J and Class Notes on Non-linear and Logistic Regression</td>
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<tr>
<td>10 (10/26-10/30)</td>
<td>4.3, Ch8 V&amp;J</td>
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<tr>
<td>11 (11/2-11/6)</td>
<td>4.3, Ch8 V&amp;J</td>
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<tr>
<td>12 (11/9-11/13)</td>
<td>Ch1, Ch2, Ch6 JWH&amp;T</td>
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<tr>
<td>13 (11/16-11/20)</td>
<td>Ch5, Ch6, Ch8 JWH&amp;T</td>
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<tr>
<td>14 (11/30-2/4)</td>
<td>Ch4, Ch8 JWH&amp;T</td>
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<tr>
<td>15 (12/7-12/11)</td>
<td>Ch4, Ch8 JWH&amp;T</td>
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Laboratory and Homework Policy:

You may ask your instructor or TA for (limited) help with the assignments. And you may discuss them with fellow students. But each individual must independently write up his or her own assignments for turning in. This is an integrity issue. Do not copy what someone else has written and turn it in as your own. Do not use someone else's computing code. You must use your own words, symbols, and code. Each student will attach a cover sheet to his or her assignments with the following written out, signed, and dated in his or her own handwriting:

I have neither given nor received unauthorized assistance on this assignment.

Grading System: The following system will be used to determine course grades.

1. Examinations will be assigned +/- letter grades.
2. The best 4 out of 5 of the following grades will be averaged for each student:
   - Exam 1, Exam 2, Exam 3, Final, Final
3. Laboratory and homework performance will be taken into account in deciding how to round off the average grades from above.
   a) The averages of students in the top 15% of the class on laboratories and homeworks will be rounded up and 1/3 of a letter grade added (provided at least 75% of possible points have been earned). For example:
      \[
      \begin{aligned}
      \text{Hour Exams C,B,B} \\
      \text{Final Exam B–, (B–)} \rightarrow \text{Average is B – /B} \\
      \text{Course Grade is } B + \left( \frac{1}{3} \text{ of a letter grade} \right) = B +
      \end{aligned}
      \]
   b) The averages of students not in the top 15% of the class on laboratories and homeworks but with at least 75% of all possible laboratory and homework points will be rounded up. For example:
\{\text{Hour Exams C,B,B} \} \rightarrow \text{Average is B-} / \text{B}

\text{Course Grade is B-}

c) The averages of students with 50%-75% of all laboratory and homework points will be rounded down. For example:

\{\text{Hour Exams C,B,B} \} \rightarrow \text{Average is B-} / \text{B}

\text{Course Grade is B-}

d) The averages of students with less than 50% of all laboratory or homework points will be rounded down, and (at Prof. Vardeman's discretion) 1/3 of a letter grade may be subtracted in order to produce a course grade. For example, potentially:

\{\text{Hour Exams C,B,B} \} \rightarrow \text{Average is B-} / \text{B}

\text{Course Grade is (B-)} - \left(\frac{1}{3} \text{ of a letter grade}\right) = \text{C+}

\textbf{Academic Honesty:} Prof. Vardeman and his Departments expect that all students will be honest in their actions and communications. Individuals suspected of committing academic dishonesty will be reported to the Dean of Students Office per University policy. For more information regarding Academic Misconduct see \url{http://www.dso.iastate.edu/ja/academic/misconduct.html}

\textbf{Professionalism Statement:} Prof. Vardeman and his Departments expect that all students will behave in a professional manner during all interactions with fellow students, faculty, and staff. Treating others with respect and having constructive communications (including use of appropriate forms of address) are examples of being professional. Being prompt and considerate of your classmates and instructor in your coming and going are examples of being professional. Class is scheduled for 1:10-2:00. Prof. Vardeman will do his best to start and end promptly. Please do your part too. If you must (unavoidably) arrive late, please get in and into a seat with as little commotion as possible. If you are (unavoidably) going to have to leave early (even a couple minutes early), it is common courtesy to let your instructor know in advance, and then try to get out as unobtrusively as possible. A lecture (like a business meeting!) is not a salad bar where participants drift in and out as it suits them. We will practice civil/courteous/professional behavior in Stat 401B.

\textbf{Texting} or surfing the Web or using electronic games or communication devices, reading newspapers, doing puzzles, and carrying on extra-curricular conversations during lectures are all examples of \textit{unprofessional and completely unacceptable} classroom conduct. Prof. Vardeman WILL stop class, make a scene, and potentially ask you to leave if you engage in such behavior. PLEASE do not precipitate such unpleasantness by ignoring this expectation of civil/considerate behavior.

\textbf{Accommodation for Students with Disabilities:}

Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact Prof. Vardeman to set up a meeting as soon as you become aware of your need. Before meeting with Prof. Vardeman, you will need to obtain a SAAR form with recommendations for
accommodations from the Disability Resources Office, located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7220 or email disabilityresources@iastate.edu. Retroactive requests for accommodations will not be honored.

**Dead Week:**

This class follows the Iowa State University Dead Week guidelines as outlined in http://catalog.iastate.edu/academiclife/#deadweek

**Harassment and Discrimination:**

Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

**Religious Accommodation:**

If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.

**Contact Information:**

If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu.